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On the parasite fauna of *Microtus oeconomus* Pallas, 1776 ssp. *mehelyi* Éhik, 1928 in Hungary (Trematoda, Cestoda, Nematoda, Siphonaptera)

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Abstract: Parasitological investigations of eighty-four *Microtus oeconomus* ssp. *mehelyi* in Hungary revealed the occurrence of twelve helminths (two Trematoda, five Cestoda, five Nematoda) and of six Siphonaptera species. *M. oeconomus mehelyi* is a new host for the following five parasite species: *Psilotrema simillimum* (Mühling, 1898) - Trematoda - *Vampirolepis asymmetrica* (Janicki, 1904), *Anoplocephaloides dentata* (Galli-Valerio, 1905) - Cestoda -*Ctenophthalmus agyrtes agyrtes* (Heller, 1896) and *Peromyscopsylla bidentata* (Kolenati, 1860) - Siphonaptera.
Key words: *Microtus oeconomus mehelyi* (Rodentia), parasite fauna, helminths, fleas.

Introduction

The distribution of *Microtus oeconomus* Pallas, 1776 ssp. *mehelyi* Éhik, 1928 besides Hungary is only limited to the eastern part of Austria and the southern territory of Slovakia (Danube-region) (Éhik 1928, Erhardová 1955, Niethammer & Krapp 1982). This species belongs to the scarce and protected mammals listed in the "Hungarian Red Book".

The original area was fragmented into remnant patches, such as marshlands and bogs. After the draining of boggy areas and marshlands the stock of *M. oeconomus* sharply decreased, only small, island-like, isolated populations survive in these special biotopes.

Taking into consideration this fact our parasitological investigation was based only on a limited number of specimens. In 1964 a large population was found in the Kis-Balaton Landscape Protection Area (LPA), where we could collect 43 specimens. The number of investigated individuals dramatically decreased in 1974 and 1982. Currently, the size and condition of this population is unknown.

Several samples were also taken from isolated populations of Lake Fertő, Hanság Nature Reserve and Szigetköz Nature Reserve between 1987-1990 and in 1974 near the town Sopron.

Twelve internal parasite species were identified (2 Trematoda, 5 Cestoda, 5 Nematoda). Of the external parasites fleas (6 Siphonaptera) were only investigated.

A) Internal parsites of *Microtus oeconomus mehelyi* in Hungary

Trematoda

Notocotylidae Lűhe, 1909

Notocotylus noyeri Joyeux, 1922

Localities: Ásványráró, Kis-Balaton.

Location: Intestinum tenue. Intensity: 5 - 42 specimens.

Psilostomatidae Odhner, 1913

Psilotrema simillimum (Mühling, 1898)

Localities: Győrladamér, Fertőboz.

Location: intestinum tenue, intestinum crassum. Intensity: 1-5 specimens.

This species occurs in birds (Anseriformes) and small mammals (Rodentia) living in aquatic biotopes. This is the first report from *Microtus oeconomus*..

Cestoda

Taeniidae Ludwig, 1886

Taenia mustelae (Gmelin, 1790) - metacestodes-

syn.: *T. tenuicollis* Rudolphi, 1819

Localities: Sopron Kis-Tómalom, Fertőújlak, Hanság Fehértó, Hanság Barbacsi-tó, Vámosszabadi.

Location: in the liver tissue. Intensity: 1-4 cysticercus per intermediate hosts.

Definitive hosts of *T. mustelae* are *Mustela nivalis* and *M. erminea*, distributed all over Hungary. The cysticercus larvae are frequent in all microtid species (intermediate hosts). In the *M. oeconomus* populations examined, this species was the most common tapeworm. Prevalence in *M. oeconomus* 8.3%, in Hungarian Microtidae material (3600 voles examined) 3% (Murai 1982).

Taenia taeniaeformis (Batsch, 1786) - metacestodes -

syn.: *Hydatigera taeniaeformis* (Batsch, 1786)

Locality: Kisbajcs.

Location: on the liver surface. Intensity: one strobilocercus.

Definitive hosts of *T. taeniaeformis* are domestic and wild cats. Intermediate hosts are all microtid and murid rodents. The prevalence in *M. oeconomus* was very low (one case).

Hymenolepididae Fuhrmann, 1907

Vampirolepis asymmetrica (Janicki, 1904)

syn.: *Hymenolepis asymmetrica* Janicki, 1904

Locality: Kis-Balaton.

Location: the terminal-part of intestinum tenue. Intensity: one specimen.

V. *asymmetrica* is the most important Hymenolepididae parasite of microtines, living in mountain forests and in dampy woods of lowlands and hilly country. From *M. oeconomus* this is the first record.

Anoplocephalidae Cholodkowsky, 1919

Anoplocephaloides dentata (Galli-Valerio, 1905)

syn.: *Paranoplocephala brevis* Kirschenblat, 1938.

Localities: Kis-Balaton, Fertőújlak, Hanság Fehértó.

Location: caecum and the terminal-part of intestinum tenue.

Intensity: 1-3 specimens.

A. dentata occurs in microtid species from the late autumn to spring, in *M.oeconomus* it is the first record from Hungary.

Paranoplocephala omphalodes (Hermann, 1783)
syn.: *Aprostatandrya macrocephala* (Douthitt, 1915)

Locality: Kis-Balaton.

Location: intestinum tenue. Intensity: 1-2 specimens.

Edelényi (1966) recorded the species under the synonymous name from the Kis-Balaton population. The specimens deposited in the Hungarian Natural History Museum correspond with the new description of the species (Tenora & Murai 1980, Tenora *et al.* 1985).

Nematoda
Trichocephalidae Baird, 1853
Trichocephalus muris Schrank, 1788

Localities: Kis-Balaton (3 cases), Fertőboz (one case), Hanság Barbacsi-tó (2 cases), Ásványráró (2 cases).

Location: intestinum crassum and caecum. Intensity: 1-3 specimens (total of 10 females).

Heligmosomidae Cram, 1927
Heligmosomum costellatum (Dujardin, 1845)

Locality: Ásványráró (one case).

Location: stomach. Intensity: 1 female.

Heligmosomoides laevis (Dujardin, 1845)

Locality: Kis-Balaton (14 cases).

Location: intestinum tenue. Intensity: 1-8 specimens (specimens examined: 15 males and 18 females).

Boreostrongylus minutus (Dujardin, 1845)

Localities: Kis-Balaton (one case), Hanság Fehértó (one case).

Location: intestinum tenue. Intensity: 1-8 specimens (3 males and 6 females examined).

Syphaciidae Skrjabin et Schikhobalova, 1951
Syphacia nigeriana Baylis, 1928

Localities: Kis-Balaton (7 cases), Sopron Kis-Tőmalom (2 cases), Lipót (one case), Győrladamér (2 cases), Hanság Fehértó (one case), Hanság Barbacsi-tó (2 cases), Ásványráró (one case).

Location: caecum and intestinum crassum. Intensity: 1-96 specimens (total of 245 specimens examined).

B) External parasites of *Microtus oeconomus mehelyi* in Hungary

Siphonaptera

Hystrichopsyllidae Taschenberg, 1880

Hystrichopsylla o. orientalis Smit, 1956

Locality: Fertőújlak, November 1987 (1 female).

Ctenophthalmus agyrtes bosnicus Wagner, 1936

Localities: Kis-Balaton, March 1982 (1 male), Fertőújlak, November 1987 (1 male and 2 females), Hanság Fehértó, March 1988 (2 males and 5 females).

Ctenophthalmus agyrtes agyrtes (Heller, 1896)

Localities: Lipót Macska-sziget, June 1987 (1 female), Győrladamér, May 1987 (2 females).

Ctenophthalmus assimilis (Taschenberg, 1880)

Localities: Lipót Macska-sziget, June 1987 (1 male), Kisbajcs, June 1987 (2 males and 1 female), Fertőboz, November 1987 (2 males and 1 female).

Peromyscopsylla bidentata (Kolenati, 1860)

Locality: Királytó, March 1988 (1 male).

Ceratophyllidae Rothschild, 1907

Megabothris walkeri (Rothschild, 1902)

Localities: Lipót Macska-sziget, June 1987 (1 male), Kisbajcs, June 1987 (3 males and 1 female), Fertőboz, November 1987 (1 felame), Fertőújlak, November 1987 (1 female), Hanság Fehértó, March 1988 (1 female).

Notes: Szabó (1969, 1975) recorded from the Kis-Balaton sample (33 host specimens examined in December 1964) the occurrence of *Hystrichopsylla t. orientalis* (2 cases), *Ctenophthalmus agyrtes bosnicus* (3 cases), *Ctenophthalmus assimilis* (1 case), and *Megabothris walkeri* (2 cases) as external parasites of *Microtus oeconomus mehelyi*. *Ctenophthalmus agyrtes agyrtes* and *Peromyscopsylla bidentata* are new parasites for *M. oeconomus* in Hungary.

Discussion

Among the 84 *Microtus oeconomus mehelyi* individuals, collected in Hungary 50 (58 per cent) specimens were infested with helminths. As concerns the internal parasites of *M. oeconomus* the following is worth noting:

1, The number of parasitic worms found in host species was between 1-96, depending on individuals.

2, Our data correspond to observations concerning worm-infectedness of rodents.

3, Parasite composition of Méhely's root-vole proved very simple in comparison with other microtid species found in Hungary (Matskási 1974, Mészáros 1977, 1978, Murai 1974, Tenora *et al.* 1973).

4, All the identified helminths of *M. oeconomus mehelyi* are usually found in other microtids (Table 1).

5, *Heligmosomum costellatum*, which is one of the common nematodes of *Microtus arvalis* was only discovered in one case from *M. oeconomus*.

6, *Heligmosomoides laevis* had been still found with 32 per cent prevalence in the territory of Kis-Balaton LPA in 1964, but it has not occurred in the populations of Győr-Moson-Sopron.

The present results, such as the above mentioned differences, suggest that further investigations are needed in order to solve this question.

Table 1. Internal parasites of *Microtus oeconomus mehelyi* in Hungary

Localities*	Kis-Balaton					Marshy biotops in Győr-Moson-Sopron									
Number of samples	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL
Number of animals examined	43	2	1	3	3	2	2	1	4	3	3	10	5	2	84
Number of animals infested	24	1	1	3	2	1	1	1	3	3	2	4	3	1	50
Trematoda															
Notocotylus noyeri	2	1	-	-	-	-	-	-	-	-	-	-	1	-	4
Psilotrema simillimum	-	-	-	-	-	1	-	-	1	-	-	-	-	-	2
Cestoda															
Anoplocephaloides dentata	1	-	-	-	1	-	-	-	-	-	1	-	-	-	3
Paranoplocephala omphalodes	3	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Vampirolepis asymmetrica	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Taenia mustelae (m**)	-	-	-	2	1	-	-	-	-	2	-	1	-	1	7
Taenia taeniaeformis (m**)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Nematoda															
Trichocephalus muris	3	-	-	-	-	1	-	-	-	-	-	2	2	-	8
Heligmosomum costellatum	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Heligmosomoides laevis	14	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Boreostrongylus minutus	1	-	-	-	-	-	-	-	-	1	-	-	-	-	2
Syphacia nigeriana	7	-	-	2	-	-	1	-	2	1	-	2	1	-	16

* Sample sites: Kis-Balaton Landscape Protection Area (1 – 3) – 1 = Diás-sziget, December 1964, 2 = Diás-sziget, July 1974, 3 = Diás-sziget, March 1982. Marshy biotops in Győr-Moson-Sopron (4 – 14) – 4 = Sopron Kis-Tómalom, October 1974, 5 = Fertőújlak, November 1987, 6 = between Fertőboz and Balf, November 1987, 7 = Lipót, June 1987, 8 = Kisbajcs, June 1987, 9 = Győrladamér, June 1987, 10 = Hanság Fehértó, June 1987, 11 = Hanság Fehértó, March 1988, 12 = Hanság Barbacsi-tó, October 1989, 13 = Ásványráró, October 1990, 14 = Vámosszabadi, October 1990,

**metacestodes

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